

ORC - 4730  
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25 March 1963

MEMORANDUM FOR : The Record

SUBJECT : Oxygen Consumption vs. Ships Supply ORCAIT

1. On pressure suit flights to date the average oxygen consumption rate has been 23 liters per minute in contrast to the anticipated 13-15 lpm. This accelerated rate is presently unaccounted for, however, several variables are important including pilot work load resulting in physical activity within the cockpit, pilot anxiety and individual differences in base line consumption rate. Altitude indoctrination runs at the Fireweel Company reveal consumption rates in the range of 9-13 lpm when the subject is at rest and up to 19 lpm while exercising. Fireweel does not attempt to introduce anxiety into their indoctrination runs.

2. Flights of eight hours and fifteen minutes duration were originally required and ships supply was provided via two 875 cu. in. oxygen bottles charged to 2000 lbs. pressure. This capacity, assuming consumption at approximately 13-15 lpm, fulfilled the original requirement taking into account that one bottle could malfunction mid way in the mission and return could be accomplished on the remaining bottle.

3. In view of the present requirement of ten and one half hour flights and recognizing the increased oxygen usage rates more space is being allocated for longer bottles charged to higher pressures. By lengthening each bottle 5 7/8 inches, the volume is increased to 1100 cu. in. The charging pressure will be increased to 2800 psi. Present planning calls for retrofit by 1 August 1963.

4. With the larger bottles charged at the increased pressure a flight of eleven hours (timed from take off) could be completed if both bottles functioned normally. If one bottle malfunctioned at mid way point, a flight of approximately eight hours and forty-five minutes would be possible. Under both conditions only 50 lbs. of oxygen would remain which is below generally accepted standards.

SIGNED

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